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EXAMINER	
FLANDERS, ANDREW C	
ART UNIT	PAPER NUMBER
2615	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Supplemental Notice of Allowability	Application No. 09/856,734	Applicant(s) BARTLETT ET AL.	
	Examiner ANDREW C. FLANDERS	Art Unit 2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *the amendment filed 19 May 2008*.

2. ☒ The allowed claim(s) is/are *61,101-108, 147-194*.

3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☒ All b) ☐ Some* c) ☐ None of the:
      1. ☒ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☒ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

/Suhan Ni/
Primary Examiner, Art Unit 2614

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Chad Thorson on 03 September 2008.

The application has been amended as follows:

Please cancel claims 64 – 100, 109 – 113, 116, 119 and 120.

Please add the following claims

150. (New) A toy system according to claim 61, wherein the spreader comprises a first pseudo-noise code generator operable to generate a first pseudo-noise code comprising a sequence of chips, and is operable to perform direct sequence spread spectrum encoding using the first pseudo-noise code.

151. (New) A toy system according to claim 150, wherein the first pseudo-noise code generator is operable to generate a 12 bit code having 4095 chips.

152. (New) A toy system according to claim 150 wherein the spreader is operable to combine each data element of the data signal with a part of the first pseudo-noise code.

153. (New) A toy system according to claim 152, wherein the spreader is arranged to multiply each data element of the data signal by a sequence of two hundred and fifty- six chips of the first pseudo-noise code.

154. (New) A toy system according to claim 150, wherein the spreader further comprises a second pseudo-noise code generator operable to generate a second pseudo-noise code which is different to the first pseudo-noise code,

and the spreader being arranged to combine each data element of the data signal with a chip sequence from either the first pseudo-noise code or the second pseudo-noise code in dependence upon the value of the data element.

155. (New) A toy system according to claim 154, wherein the second pseudo-noise code generator is operable to generate a second pseudo-noise code orthogonal to the first pseudo-noise code.

156. (New) A toy system according to claim 61, wherein the encoder further comprises a scaler operable to scale the spread and modulated signal.

157. (New) A toy system according to claim 156, wherein the decoder further comprises a de-scaler operable to remove the scaling applied by the scaler.

158. (New) A toy system according to claim 156, wherein the scaler is operable to perform a frequency dependent scaling.

159. (New) A toy system according to claim 158, wherein the scaler is operable to increase the proportion of the energy at lower frequencies.

160. (New) A toy system according to claim 159, wherein the scaler is arranged to apply a frequency-dependent scaling function having a frequency dependence between 1/f and 1/f2, where f is the frequency.

161. (New) A toy system according to claim 159, wherein the scaling function is approximately inverse to the sensitivity of a human ear.

162. (New) A toy system according to claim 61, wherein the encoder further comprises a scaler operable to scale the spread signal and a power monitor operable to output a signal indicative of the power in the audio track to the scaler, and wherein the scaler is operable to vary the applied scaling in dependence upon the power signal output by the power monitor.

163. (New) A toy system according to claim 162, wherein the scaler is operable to adjust the power in the spread and modulated signal to be a fixed amount below the power in the audio track, unless the power of the audio track is below a threshold in which case the power of the spread and modulated signal is set at a predetermined level.

164. (New) A toy system according to claim 61, wherein the encoder further comprises a scaler operable to scale the spread and modulated signal and a psycho-acoustic analysis system for determining theoretical minimum audible sound levels in the presence of the audio track, and wherein the scaler is operable to scale the spread signal in accordance with the determined theoretical minimum audible sound levels.

165. (New) A toy system according to claim 164, wherein the scaler is operable to scale the power of the spread and modulated signal to be at or above the determined minimum audible sound level.

166. (New) A toy system according to claim 165, wherein the scaler is operable to scale the power of the spread and modulated signal to be a predetermined amount above the theoretical minimum audible level.

167. (New) A toy system according to claim 164, wherein the psycho-acoustic analysis system is operable to analyze the audio track in segments whose duration

corresponds to the duration of an integer number of data elements of the data signal, and wherein the encoder is operable: (1) to scale a portion of the spread and modulated signal corresponding to one data element of the data signal in accordance with the minimum audible sound level calculated for a segment of the audio track; and (ii) to subsequently combine said portion of the spread and modulated signal with said segment of the audio track.

168. (New) A toy system according to claim 167, wherein the decoder does not include a de-scaling unit.

169. (New) A toy system according to claim 164, wherein the psycho acoustic analysis unit is operable to generate frequency-dependent scaling factors corresponding to a segment of the audio track in accordance with the frequency spectrum of that segment.

170. (New) A toy system according to claim 150, wherein said decoder is operable to demodulate the electrical signal,

wherein the decoder comprises a second pseudo-noise code generator operable to generate a second pseudo-noise code identical to the first pseudo-noise code, and wherein the decoder is operable to synchronously multiply the demodulated signal by the second pseudo- noise code to form a de-spread signal.

171. (New) A toy system according to claim 150, wherein the decoder of the toy comprises:

a second pseudo-noise code generator operable to generate a second pseudo-noise code identical to the first pseudo-noise code, and wherein the decoder is operable to synchronously multiply the electrical signal by the second pseudo-noise code to form a de-spread signal; and

a demodulator operable to demodulate the de-spread signal to form a demodulated signal.

172. (New) A toy system according to claim 170, wherein the decoder comprises a rake receiver having a plurality of prongs, and the decoder is operable to introduce different time delays between the electrical signal and the second pseudo-noise code in each prong of the rake receiver, in order to de-spread different components of the electrical signal.

173. (New) A toy system according to claim 170, wherein the decoder further comprises a synchronization circuit operable to synchronize the second pseudo-noise code with a code sequence conveyed by the electrical signal.

174. (New) A toy system according to claim 173, wherein the synchronization circuit comprises:

a correlator operable to generate a time-varying output dependent on the similarity of a chip sequence conveyed by the electrical signal and a predetermined chip sequence; and

a normalization circuit operable to scale the time-varying output of the correlator by a normalization factor determined from the average value of the time-varying output over a predetermined period of time.

175. (New) A toy system according to claim 174, wherein the normalization circuit comprises a calculator operable to calculate a running average of the time-varying output over the predetermined period of time.

176. (New) A toy system according to claim 173, wherein the synchronization circuit comprises:

a correlator operable to generate a time-varying output by correlating a chip sequence conveyed by the electrical signal and a predetermined chip sequence;

a cross-correlator operable to cross-correlate the output of the correlator over a first time period with the output of the correlator over a second time period; and

a determiner operable to determine a frequency offset between the frequency at which the second pseudo-noise code generator generates the second pseudo-noise code and the frequency of the code sequence conveyed by the electrical signal from the output of the cross-correlator.

177. (New) A toy system according to claim 173, wherein the synchronization circuit comprises:

a correlator operable to generate a time-varying output by correlating a chip sequence conveyed by the electrical signal and a predetermined chip sequence;

a cross-correlator operable to cross-correlate the output of the correlator over a first time period with the output of the correlator over a second time period; and

a determiner operable to determine the difference between the chip rate of the predetermined chip sequence and the chip rate of the chip sequence conveyed by the electrical signal from the output of the cross-correlator.

178. (New) A toy system according to claim 176, further comprising a normalization circuit operable to scale the time-varying output of the correlator by a normalization factor determined from the average value of the time-varying output over a predetermined period of time.

179. (New) A toy system according to claim 178, wherein the normalization circuit comprises a running average calculator operable to calculate a running average of the time-varying output over the predetermined period of time.

180. (New) A toy system according to claim 173, wherein the synchronization circuit comprises:

a plurality of correlators, each correlator arranged to generate a time-varying output determined by correlating a chip sequence conveyed by the electrical signal and a respective predetermined chip sequence; and

a controller operable to control the second pseudo-noise code generator in accordance with the outputs of the plurality of correlators, wherein the respective predetermined chip sequences have the same chip rate.

181. (New) A toy system according to claim 180, wherein the plurality of correlators are cascaded in series.

182. (New) A toy system according to claim 180, wherein the plurality of correlators are connected in parallel.

183 (New) A toy system according to claim 180, further comprising a plurality of normalization circuits, each normalization circuit being operable to scale the time-varying output of a respective one of the plurality of correlators by a normalization factor determined from the average of the time-varying output of that correlator over a predetermined period of time.

184. (New) A toy system according to claim 183, wherein the normalization circuit comprises a running average calculator operable to calculate a running average of the time-varying output over the predetermined period of time.

185. (New) A toy system according to claim 173, wherein the synchronization circuit further comprises:

a plurality of cross-correlators, each cross-correlator being arranged to cross-correlate the output of a respective one of the plurality of correlators over a first time period with the output of that respective correlator over a second time period;

an adder operable to add the outputs of each of the cross-correlators; and

a determiner operable to determine a frequency offset between the frequency at which the 2 second pseudo-noise code generator generates the second pseudo-noise code and the frequency of the spreading code in the electrical signal from the output of the adder.

186. (New) A toy system according to claim 174, wherein the correlator is formed by a matched filter.

187. (New) A toy system according to claim 61, wherein the encoder forms part of a television broadcast system, and the electro-acoustic transducer is formed by a loudspeaker of a television set.

188. (New) A toy system according to claim 61, wherein the audio track is the audio track of a television programme, and the data signal is operable to enable the toy to interact with the television programme.

189. (New) A toy system according to claim 61, in which the modified audio track is recorded on a recording medium, and the toy system further comprises a reproducing apparatus, including the electro-acoustic transducer, for reproducing the modified audio track stored on the recording medium.

190. (New) A toy system according to claim 189, wherein the recording medium is a compact disc.

191. (New) A toy system according to claim 189, wherein the recording medium is a video cassette.

192. (New) A toy system according to claim 171, wherein the decoder comprises a rake receiver having a plurality of prongs, and the decoder is operable to introduce different time delays between the electrical signal and the second pseudo-noise code in each prong of the rake receiver, in order to de-spread different components of the electrical signal.

193. (New) A toy system according to claim 177, further comprising a normalization circuit operable to scale the time-varying output of the correlator by a normalization factor determined from the average value of the time-varying output over a predetermined period of time.

194. (New) A method of controlling a toy, the method comprising the steps of:

receiving, at a control center, a data signal defining a sequence of data symbols, the data signal having a data signal bandwidth, defined by a symbol duration of said data symbols, that is centered around a first frequency;

spreading the received data signal or a carrier signal modulated with the received data signal to form a spread signal having a signal bandwidth greater than said data signal bandwidth;

either:

a) using the data signal before being spread in said spreading step to modulate at least one separate periodic carrier signal, having a period which is smaller than said symbol duration, to form a modulated carrier signal such that, after spreading in said spreading step, a main band of a power spectrum of the spread and modulated signal is centered around a second frequency that is different from said first frequency and that lies within an audible frequency band of 20 Hz and 20 kHz; or

b) using the data signal after being spread in said spreading step to modulate at least one separate periodic carrier signal, having a period which is smaller than said symbol duration, such that a main band of a power spectrum of the spread and modulated signal is centered around a second frequency that is different from said first

frequency and that lies within an audible frequency band of 20 Hz and 20 kHz;

combining the spread and modulated signal with an audio track to form a modified audio track;

transmitting the modified audio track to an electro-acoustic transducer in the vicinity of the toy;

converting the modified audio track into an acoustic signal at the electro-acoustic transducer;

receiving the acoustic signal at the toy;

converting the acoustic signal received by the toy into an electrical signal;

de-spreading and demodulating the electrical signal obtained by converting the acoustic signal to generate a de-spread signal;

regenerating the data signal from the demodulated and de-spread signal; and

controlling the toy in accordance with a content of the data signal.

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement filed 19 May 2008 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because entry 57 does not include a date. It has been placed in the application file, but the information referred to without a date has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609.05(a).

Allowable Subject Matter

Claims 61, 101—108, 147—194 are allowed.

The following is an examiner's statement of reasons for allowance:

Independent claims 61 and 194 claim a modulator. This modulator is operable to modulate at least one separate periodic carrier. As stated in Applicant's remarks, the combination does not involve any modulation of any separate periodic carrier signal with the data signal, either before or after it is spread. While these features are somewhat known in the art, neither Nuytkens nor Lee disclose them explicitly. Nuytkens has a particular method for embedding the hidden data and adding additional features would increase the complexity of the device without increasing its performance. It also would

not add any additional desirable features that would enhance the use of the device. It is simply a different way of embedding data and modifying Lee or Nuytkens to perform these tasks would require significant rework and would not be obvious without the aid of Applicant's specification.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANDREW C. FLANDERS whose telephone number is (571)272-7516. The examiner can normally be reached on M-F 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Suhan Ni can be reached on (571) 272-7505. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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